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NUCLEAR DEVELOPMENT AND PROTECTION

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WORLDWIDE REPORT
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NUCLEAR SYMPOSIUM OPENS IN JAPAN AS PROTESTERS GATHER

OW260515 Tokyo KYODO in English 0406 GMT 26 Nov 79 OW

[Text] Tokyo Nov 26 KYODO--A public symposium on the Three Mile Island nuclear accident in the United States last March opened in confusion here Monday as antinuclear campaigners tried to block it. Amid yells of some 200 nuclear protesters who gathered from across the country outside the auditorium at Chuo University, Koji Fushimi, chairman of the Science Council of Japan, declared the meeting open. Only 30 people heard Fushimi's opening address, and about 470 others invited to attend were prevented from entering.

In a series of skirmishes with about 150 riot policemen outside the auditorium, three nuclear opponents were arrested for obstructing police duties. About one hour after the symposium was declared open, some invited experts began to distribute handbills carrying criticism of the symposium, causing more confusion. The dissident experts included Sanshiro Kume, a lecturer in nuclear chemistry at Osaka University, who argued that the symposium limited to data on the Three Mile accident supplied by the United States was not "academic," and demanded Fushimi's comment. He was ordered out by the chairman but refused to leave.

Holding a symposium on the safety of nuclear power generation was first proposed by the government's nuclear Safety Commission when it was created in October last year and the Science Council of Japan later backed the idea. They cosponsored the event. The U.S. nuclear accident was later taken up as a topic. Since then, civic groups have complained that the symposium would probably be used by nuclear authorities as a means of coping with objections to nuclear power generation from environmentalists. The symposium is aimed at eventually promoting the government's nuclear power policy, the groups say.

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WORLDWIDE AFFAIRS

NO PROBLEMS FORESEEN FOR ARGENTINE EXPORT OF ATUCHA II REACTOR

PY271602 Buenos Aires CLARIN in Spanish 24 Nov 79 p PY

[Excerpts] Peter von Siemens and Walter Boos of Siemens AG of the FRG yesterday explained the characteristics of the joint enterprise which will be composed of its branch, Kraftwerk Union [KWU], and the National Atomic Energy Commission. The businessmen minimized the emergence of significant political obstacles.

At a press conference held before returning to his country, the president of the control council [consejo de vigilancia] of Siemens AG, Peter von Siemens, was optimistic about a favorable decision by the Bonn Government on the granting of licenses for the export of the nuclear reactor for the Atucha II nuclear plant. He pointed out that such licenses will be granted no later than January.

Peter von Siemens, together with the Siemens vice president for Argentina, Walter Boos, discussed the joint Argentine-German enterprise which will be formed between KWU (Siemens' branch for nuclear technology) and the National Atomic Energy Commission.

Asked if some political difficulties could arise in the granting of the license for the export of the nuclear reactor, Boos said "As for the German Government, in spite of some items published in some German newspapers, we are convinced that we are not going to have any significant political difficulties." Von Siemens added: "German public opinion, which is diverse, is not going to have a negative influence on this project."

Regarding the nuclear engineering enterprise, Boos asserted that it will be subscribed 75 percent by the National Atomic Energy Commission and 25 percent by KWU. The tentative name is "Argentinatom." The enterprise has been given guarantees concerning the free export of technology to other countries. Boos flatly denied that the German KWU has veto power in this joint enterprise.

The Siemens Argentina commercial manager, Ekkehardt Roethke, outlined the financial plan of the Atucha II plant. The estimated cost is \$1.5 billion completely financed by Germany, even though this is still being negotiated. The credit package is divided into two parts: The equipment supplied from Germany and other countries will be channeled through the Kreditanstalt of Frankfurt, an official institution with credit insurance for export; the rest of the expenditures, including the Argentine part, will be financed by a consortium of banks headed by the Westdeutsche Landesbank of Dusseldorf.

Asked about the maximum power to be supplied by Atucha II, Boos said: "It cannot be known yet, since it depends on its design, which will be concluded within two years." The

guaranteed output power will be 692 megawatts, but the effective output power can exceed that figure, as happened with Atucha I, the output of which was guaranteed at 320 megawatts but finally reached 365 megawatts.

Asked about his impression of Argentina, Von Siemens said: "My impression is that the country is progressing steadily. There is no unemployment and the balance of payments is favorable; the economic future of the country is positive with its large petroleum and gas deposits."

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WORLDWIDE AFFAIRS

BRAZILIAN MINISTER CONFIRMS NUCLEAR AGREEMENT WITH IRAQ

PY271447 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 25 Nov 79 p 70 PY

[Text] Brasilia--In an exclusive interview with O ESTADO DE SAO PAULO, Mines and Energy Minister Cesar Cals has revealed that Brazil will soon sign an agreement with Iraq on the transfer of nuclear technology initially involving technical assistance and the training of personnel. But in addition to these items, the technologies for licensing nuclear plants and searching for and concentrating uranium are also for sale. Minister Cals said that in due time, when Brazil has come to rely on more sensitive nuclear technology, especially enriching and reprocessing uranium, it will decide on transferring it to other countries.

Cals also revealed that all the petroleum which Brazil needs for next year--approximately 1 million barrels daily--has been assured, and that if there is political stability in the Middle East, the supply will be guaranteed. He denied that Planning Minister Delfim Netto may be in the Middle East negotiating the purchase of petroleum, stating that the planning minister is following guidelines established by the president of the republic for tightening Brazilian trade relations with the petroleum-producing countries in that region.

Minister Cals also said: "The energy sector during the next 5 years will spend \$50 billion--half for electricity and half for liquid fuel--and of the total, some 20 percent, or \$10 billion, will come from abroad.

"The financial program for alcohol and coal has also been established. The resources will be divided into equal parts, coming from the energy movement fund [fundo de mobilizacao energetica], the BNDE [National Economic Development Bank], private initiative and foreign loans.

"The petroleum reserves which have been identified guarantee a production of 360,000 barrels daily for the next 5 years, while the new strata which are being discovered and the new risk contracts will make up the remaining 140,000 barrels daily. This will fulfill the government's goal of producing at least 500,000 barrels daily by 1985.

"The nine nuclear plants provided for by the FRG-Brazilian agreement will be operating by 1995, supplying 10 percent of the overall installed capacity to generate electricity, but the pace of their installation, including the orders [encomendas], will depend on the rate of transfer of technology from the FRG.

"The interconnection of systems is the technical option chosen to make feasible the supply of energy to the northeast and southeast from the future Amazonas hydroelectric dam, and the interconnection will be made directly to the northeast and through the central west to the consumption centers in the southeast."

WORLDWIDE AFFAIRS

BRAZILIAN URANIUM ENRICHING PLANT TO BEGIN TESTS IN 1980

PY291407 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 28 Nov 79 p 5 PY

[Excerpt] The uranium enriching pilot plant--which is part of the group of nuclear units provided for in the Brazilian-FRG nuclear agreement--is ready to be shipped to Brazil by plane. This information was given to O ESTADO DE SAO PAULO yesterday by Mines and Energy Minister Cesar Cals. This pilot plant will be installed in Belo Horizonte at the Nuclear Technology Development Center, and it should be ready for the first tests by the first quarter of 1980.

This is the next-to-last stage in transferring the fuel cycle. What is needed now is the plant that reprocesses the uranium "burned" inside the reactor, about which Minister Cals kept silent. The nuclear fuel cycle involves the concentration of nuclearly pure uranium (yellow cake); the production of uranium gas (uranium hexafluoride), which is being studied by the Energy Research Institute of the Sao Paulo University; the production of fuel elements (uranium rods and pellets), the enrichment and, finally, the processing.

The pilot will function with the jet nozzle method developed by the Germans but not yet tested on an industrial scale, and this is the reason for the criticism of the reliability of the system and also of the high energy consumption level--higher than that of the other enrichment methods: the gas centrifuge process and the gaseous diffusion process.

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WORLDWIDE AFFAIRS

BRIEFS

PAKISTAN URANIUM DENIAL--Jidda--The Pakistan Embassy in the kingdom [of Saudi Arabia] today refuted reports by news agencies that a truck carrying uranium from a French mining area in Niger has been hijacked and that the consignment was transferred to Libya and then to Pakistan. In a statement the embassy said these reports are unfounded, and described them as being part of a distortion campaign by the Western information media against the Pakistan nuclear program for peaceful purposes. [Text] [LD262211 Riyadh SNA in Arabic 2057 GMT 26 Nov 79 LD]

SIEMENS BUSINESSMEN ARGENTINE VISIT--The German industrialist Peter Von Siemens and a group of employees of the FRG Siemens enterprise met with Economy Minister Jose Alfredo Martinez de Hoz today. Unofficial sources reported that the plan for the expansion of the telephone system in Argentina and the nuclear reactor which the Kraftwerk Union (KWU) enterprise, a subsidiary of Siemens, will provide for the Atucha II nuclear plant were the subjects discussed during the meeting. [Buenos Aires TELAM in Spanish 1805 GMT 20 Nov 79 PY]

BRAZILIAN DELEGATION TO IAEA--The Brazilian delegation to the 23rd ordinary meeting of the International Atomic Energy Agency will be headed by Professor Hervaldo Guimaraes de Carvalho, president of the Brazilian Nuclear Energy Commission. This meeting is to be held in New Delhi from 4-10 December. [Brasilia Domestic Service in Portuguese 2200 GMT 27 Nov 79 PY]

CEMA MEETING IN POLAND--A session of the CEMA Standing Commission on the Utilization of Nuclear Power for Peaceful Purposes was held in the Polish town of Zelena Gora. The session was attended by delegations of Bulgaria, Hungary, Vietnam, the GDR, Cuba, Poland, Romania, the USSR and Czechoslovakia. Representatives of Yugoslavia and of a number of international organizations were also present at the session. Those taking part in the session considered the drafts for an agreement and program of cooperation in the issues of nuclear power generators included in the long-term, special-purpose program of cooperation of the CEMA member countries on power, fuel and raw materials. [Text] [LD261148 Moscow Domestic Service in Russian 1730 GMT 27 Nov 79 LD]

FRG ON REACTOR TO ARGENTINA--In Bonn, West German Economy Minister Otto Lambsdorff asserted that there are no objections to the delivery of a heavy water reactor to Argentina. Nevertheless, Lambsdorff stated to the press that the Argentine-German nuclear agreement was discussed by the FRG and some of its allies. He did not mention their names. [Text]
[PY242048 Buenos Aires Domestic Service in Spanish 2000 GMT 23 Nov 79 PY]

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INDIA

BRIEFS

DEFENSE MINISTER ON NUCLEAR OPTIONS ---The defense minister, Mr C. Subramaniam, has reaffirmed his view that the country should keep its nuclear options open. Talking to newsmen in Madras, he said that it is his personal view that India should keep its options open particularly when neighboring countries are developing nuclear capability with the assistance of powers who are not very friendly toward us. We have our own means to know what is happening in neighboring countries, he said. [Excerpt] [BK211110 Delhi Domestic Service in English 0240 GMT 21 Nov 79 BK]

REPORTED RADIOACTIVE PARCEL MISSING---New Delhi, 27 Nov (AFP)---The Bhabha Atomic Research Centre (BARC) today confirmed reports of a parcel containing radioactive isotope missing while being transported from Bombay to Beawar, northwestern India, recently. The BARC in a press release in Bombay, however, sought to allay any panic among the public by assuring them that the parcel had been "completely sealed" and thus would not pose any danger "unless it is tampered with intentionally." It appealed to the public to promptly inform the centre if anyone received any information about the location of the package. [Text] [BK271009 Hong Kong AFP in English 1000 GMT 27 Nov 79 BK]

CSO: 5100

NEED FOR NUCLEAR POWER PLANT

Jakarta KOMPAS in Indonesian 18 Oct 79 p 13

[Article: "PLTN Needed in Indonesia; But Negative Results Must Be Avoided"]

[Text] Professor Dr A. Arismunandar of the Department of Mining and Energy and Professor Dr Otto Sumarwoto of the Ecology Institute of the University of Pajajaran agree that a diversity of energy supply is needed to reduce dependence on oil. Both also agree that a PLTN or nuclear power generator is needed in Indonesia. However, the latter as an environmental expert stressed that the negative aspects of a PLTN must be studied before the decision is made to begin its construction.

In his keynote address to the panel discussing "PLTNs and problems related to them" on 16 October at the Indonesian Council of the sciences, Arismunandar said that between 50-55 percent of the national income comes from oil. At the same time petroleum represents 70 percent of all foreign exchange. In addition around 80 percent of those living in the villages still depend on fire wood, which is a very disturbing situation. As a result the cutting and use of fire wood in Java has already exceeded the allowable exploitation.

According to Arismunandar, based on World Bank figures, Java will require 26,000 MW of electricity by the year 2000. And as an alternate to oil there are only two sources to meet such a large need, nuclear power and coal. "Water power, earth heat and natural gas are all too limited to produce that much energy," he said. Concerning the possibility generator reactor disasters occurring, he said that most are the results of human error. Both advocates and opponents agree that proper attention must be given to this by upgrading the skills and discipline of the operators.

Arismunandar also admitted that the present technology isn't

able to completely solve the problem of disposing of radioactive waste. He said the solution could possibly include the placing of radioactive waste containers into salt mines where the earth would be stable for up to 200 million years. But Engr Peter Hehanusa a geologist from the National Mining and Geology Institute, who spoke as an opponent, said that at the present time there aren't any such abandoned salt mines in Indonesia.

Answering a question, Arismunandar said the decision to build a PLTN represents the "political will" of us all "so that in all sectors of advanced technology we are absolutely not dependent on outside sources." In fact, according to Engr Prajoto of the PLTN Commission, of presently known reserves of uranium Indonesia has sufficient to the year 2000 for six to seven PLTNs, each with a capacity of 600 MW.

Meanwhile the Consumers Institute expressed its strong opposition to PLTNs in Indonesia through Permadi S.H.. He said as there is no National Energy Board, all handling of energy matters in Indonesia is done as incidental and this includes the PLTNs. "And this is very dangerous to the preservation of our country," he added. He also doesn't agree with the "political will" concept which in part is found mostly in the industrial sector and differs from political activity. "Energy can't be compared to the production of fertilizer or cement, etc because of its strategic value," he said. According to Permadi, energy plays a vital role in our national strategy. And in addition, he also doubts whether "PLTNs will be accompanied" by the transfer of technology and knowledge from the developed countries that make them.

In his written protest Professor Otto has doubts concerning the disposal of radioactive water from the reactor which can affect the organic life around the plant. According to Arismunandar this problem can be solved by cooling the waste water first, But he also admitted that the waste water from the reactors would need to be supervised continually. But concerning the fear of leaks in the reactor as a result of natural disasters, advocates feel this can be overcome by choosing sites in areas that are earthquake free. Based on a feasibility study conducted jointly with Italy, the location would be selected between Jepara and Gunung [Mount] Muria on the north coast of Java. According to plans the study will be completed by the end of the year and then presented to the government.

TAIWAN

BRIEFS

NUCLEAR POWERPLANT--Taipei, 16 Nov--Taiwan Power Co is planning to build the fourth nuclear power plant in northern Taiwan, according to David S. L. Chu, president of the state enterprise. Speaking at the second reconstruction seminar Tuesday, Chu told the participants that his company is now actively searching in northern Taiwan for an appropriate construction site. The first nuclear powerplant of the company was recently inaugurated and the second and third plants are still under construction. Once the three plants are completed by 1984, they can generate combined capacity of 5.14 million kilowatts or more than 30 percent of the total installed capacity of the company, he reported. According to Chu's estimate, the three plants can save the company more than U.S. dollars 1 billion in purchase of fuel and about U.S. dollars 800 million in generating cost per year. [Taipei CNA in English 0933 GMT 16 Nov 79 OW]

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BRIEFS

LARGE NUCLEAR PLANT CASTINGS--The largest ingot yet has been cast and forged from special steel in the Vitkovice, Iron and Machine Works of Klement Gottwald. It is to be machined into a ring serving as a volume compensator in a pressure vessel for a nuclear power station VVER 1000. An experimental vessel ring intended for the study of the quality of steel and verification of the production technology has been forged on a 12,000 ton press in the Vitkovice forging mill from a 140 ton ingot cast in steel mill II. The very casting and forging of the first ingot of this size for the nuclear energy development in Vitkovice is a collective success of a Vitkovice research team led by Engrs Jiri Veliska and Jan Chvojka, a casting team led by Miroslav Muras, Erhard Jurcek, and Evzen Glatz and the forging shift under Ladislav Lokaj. Yet another pressure vessel ring is to be produced this year (1979). The Vitkovice metallurgists and forging specialists, in cooperation with the researchers are thus successfully introducing a new production program directed at making components for the nuclear power electric stations VVER 1000. [Text] [Ostrava NOVA SVOBODA in Czech 13 Nov 79 p 3]

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FIGUEIREDO VISIT COULD RESULT IN NUCLEAR AGREEMENT

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 23 Nov 79 p 20

[Article by Laura Fonseca: "Brazil and Argentina Reinitiate Cooperation"]

[Text] The forthcoming visit to Buenos Aires by President Figueiredo scheduled for the second half of March, should result in a political rapprochement unprecedented in the history of the two countries, bringing important dividends in the areas of nuclear energy, industrial complementation, trade, hydroelectric utilization of the Uruguay River, technological cooperation, tourism, agriculture and fishing.

With the signing of the Itaipu-Corpus compatibilization agreement, the problem which paralyzed Brazilian-Argentine relations during the past 11 years, poisoning all attempts at rapprochement attempted by one government or the other, has disappeared. Now, both foreign ministries are engaged in emptying the desk drawers, crammed with cooperation proposals which could never be implemented because of a lack of a favorable political situation. Itamaraty estimates that there are 23 areas where there could be agreements, joint studies and implementation of agreements already signed.

Within the framework of Latin American integration with the aim of lateral cooperation for an economic development, good relationships between Brazil and Argentina are fundamentally important because they are the two most industrialized countries of the continent, and their economies show they are naturally complementary. It is not by chance that their bilateral trade is the greatest between two developing countries despite the climate of political stagnation during recent years.

With the reinitiation of an intensive political relationship--there is an express desire by the two governments in that respect--a large increase in that trade can be foreseen, trade which in 1979 should amount to \$1.5 billion. Among the goals of economic cooperation which will receive a great boost from the presidential visit, Itamaraty cites nuclear energy and industrial complementation as the most important.

On a political level, the improvement of relations will result in a strengthening of a still very incipient attempt by Argentina for its redemocratization. Brazil maintains a very clear position of noninterference in the internal affairs of others, however, just as a visit by Figueiredo to Venezuela strengthens Brazilian democratization, his visit to Buenos Aires brings winds of change to Argentina, which does not wish to remain isolated from the rest of the continent or the world. In that respect, the trips by Videla to Venezuela and Japan, already accomplished, and the visits to the Soviet Union and China next April, make very clear the intention of the Argentine Government of breaking the isolation in which it has found itself in past years.

Nuclear Energy

The most important agreement to be signed during the visit is on nuclear energy, however, the level of the document, which could be of three types, has not yet been determined. The least important would be an agreement on information and consultation; the intermediate level would be that of technical cooperation, while the third step would include industrial cooperation in the nuclear fields.

Any one of the three agreements would include reciprocal training of technicians and scientists, one of the most important points in nuclear collaboration between the two countries. The intermediate type would add an exchange of procedures and technology, where Brazil has important information in the field of uranium prospecting and mining and Argentina has technology on the reprocessing and separation of plutonium, which is not controlled by full safeguards and can, therefore, be transferred without problems.

If negotiations are processed quickly, a more complete type of nuclear agreement, which would include cooperation at an industrial level, could perhaps be signed during Figueiredo's stay in Buenos Aires. In that area, it is Brazil which has more to offer because NUCLEP [NUCLEBRAS [Brazilian Nuclear Corporations] Heavy Equipment, Inc.], which is a factory for manufacturing heavy parts for the nuclear industry, does not have a parallel in Argentina.

Although the technology of the Brazilian nuclear program is that of light water and enriched uranium and that of Argentina, the opposite, heavy water and natural uranium, there is a large area of cooperation in the various stages of the programs. In addition to that, according to technicians of the sector, "we can undertake joint research with a view to the future of the nuclear industry, developing new technology and even nuclear fusion, the great hope of the 21st Century."

Argentina is the Latin American country most developed in the nuclear field. Its first reactor, Atucha, of German technology, has been in full

operation since 1973. The second reactor of the CANDU [Canadian Deuterium Uranium] type, of Canadian origins, will go into operation in 1981. Recently Argentina signed a nuclear pact with Germany and Switzerland, which includes a third reactor, a heavy water plant, and the joint development of three more reactors of new technology, which represents an innovation for the 80's which the CANDU reactor represented for the 70's, in addition to a plant for the manufacture of heavy parts to provide a good part of the equipment needed for those reactors.

Unlike Brazil, which has all its nuclear programs under strict safeguards, Argentina has managed to develop its nuclear industry with a free hand. With the heavy water plant, they will conclude the cycle of technology of natural uranium without international supervision because Switzerland, which will provide that plant, is not a member of the London Club, therefore, it is not subject to international safeguards.

Diplomatic sources point out that a nuclear cooperation between Brazil and Argentina will bring—in addition to economic and technical benefits—a very important political dividend, eradicating the mutual fear that the nuclear program could have military objectives. By cooperating with each other, the two countries will create a climate of understanding which will make such a suspicion of military interests completely impossible. "The agreement will function as a bilateral treaty of nuclear nonproliferation, mutually guaranteeing the peaceful nature of the programs."

Industrial Complementation

The foreign ministries are studying the possibilities of industrial complementation in various sectors, taking advantage of the natural complementary character of the two economies. "Being the countries with the largest industrial park in Latin America, Brazil and Argentina can form joint ventures, with a view not only with respect to domestic markets but also with respect to exports to the entire continent."

Another promising area of cooperation is that of hydroelectric uses of the Uruguay, Garabi, Sao Pedro and Roncador Rivers, which together could produce something more than 6 million kilowatts. Those Brazilian-Argentine powerplants would bring additional benefits to river navigation, preservation of ecology and development of fishing in the region, in addition to electricity.

Diplomatic sources explain that many agreements will be signed during the visit: technical and scientific cooperation, animal health, fishing, tropical agriculture, cultural, tourism, hydroelectric utilization of the Uruguay River, a bridge between Porto Meira and Puerto Iguacu, maritime transportation, and, the most important, the nuclear agreement. "The visit, however, should not be evaluated by the number of documents but rather by the change of climate in political relationships, which is the foundation for all economic cooperation already delineated and to be developed in the future. Ever since Janio Quadros and Frondizi

met in Uruguayans in 1961, Brazil and Argentina had never again achieved a climate of understanding such as the one now presented and which brings very important prospects for the future of the two nations and Latin America in general," they say.

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CSO: 5100

NUCLEBRAS DEEMS NUCLEAR COOPERATION WITH IRAQ UNLIKELY

Sao Paulo FOLHA DE SAO PAULO in Portuguese 4 Dec 79 p 5

[Text] Rio--NUCLEBRAS [Brazilian Nuclear Corporations] sources said yesterday that an agreement of nuclear cooperation between Brazil and Iraq, which would involve the transfer of technology, is "very unlikely," because "that, above anything else, depends on the concurrence of Brazil's partner: Germany." One of the reasons pointed out by the sources as to why that concurrence would not be easily obtained was the recent statement by Germany Minister of Economy Otto Lambdorff that Brazil is not authorized to sell technology transferred by Germany.

It was also said that Brazil is still assimilating nuclear technology and that the cycle of transfer will only be completed in 1986 after the acquisition of the remaining six nuclear units stipulated in the Brazil-Germany agreement. Speaking on the subject, Minister of Mines and Energy Cesar Cals has already emphasized several times the importance of assimilating nuclear technology in the execution of the agreement and that at this time it is the greatest justification for maintaining it. The initial justification contained in the "White Book" distributed by the Geisel Government was that Brazil had a short range need for nuclear energy for generating electricity.

According to the same sources, Brazil would only be in a condition to transfer the knowhow developed in uranium research and prospecting and in the training of human resources. That fact has already been acknowledged by several authorities of the nuclear sector, even by the minister of mines and energy himself.

On the other hand, it is not clear how much interest there is by Iraq in cooperation within those restrictions since "Iraq does not have energy problems." According to those sources, it is much more probable that the interests of Iraq are in the plutonium produced during the "burning" of nuclear fuel. However, the possibility that Brazil would export that plutonium is even more remote because the supervision of plutonium storage and its transfer from one place to another are the strict responsibility of the International Atomic Energy Agency (IAEA) pursuant to the terms of the Brazil-Germany agreement.

At any rate, the subject is not discussed openly by NUCLEBRAS and yesterday its president, Paulo Nogueira Batista, declared that he "had nothing to say to the press."

BRAZIL

URANIUM ENRICHMENT PILOT PLANT ARRIVES IN BELO HORIZONTE

Rio de Janeiro JORNAL DO BRASIL in Portuguese 1 Dec 79 p 19

[Text] The jet centrifuge uranium enrichment pilot plant, which Brazil purchased from Germany, has already arrived in Belo Horizonte and will begin to operate this month. The plant is being installed at the Nuclear Technology Development Center (CDTN) of NUCLEBRAS [Brazilian Nuclear Corporations] at the campus of the Minas Gerais Federal University.

Brazilian technicians will make a program of simulations with the pilot plant, the results of which, together with those of the demonstration plant to be constructed in Resende in Rio de Janeiro, will provide the basic parameters of the engineering plans for the commercial plant. Thus, the plans could be made in Brazil instead of being purchased from Germany.

The pilot plant has only 10 stages for the separation of uranium isotopes and is going to operate in a closed circuit, which means that it will produce small amounts of enriched uranium (only a few kilograms of SWU --separative work units--which is the unit of measurement for enriched uranium). The demonstration plant to be built in Resende will produce quantities somewhat larger but still on a small scale. Production on a commercial level will only take place after 10 years with the installation of the commercial plant.

The viability of the uranium enrichment process by jet centrifuge whose world patent belongs to Brazil and Germany equally, has already been proved from the technological point of view. However, economical production on an industrial scale has not been reached yet. Research performed in the Karlsruhe Nuclear Research Center in Germany has the objective of improving the process so as to reduce its high consumption of energy.

With the installation of the pilot plant in Belo Horizonte, Brazilian technicians also seek to minimize the costs of the process so as to make it competitive with the two other existing enrichment processes--gaseous diffusion used by the United States and the Soviet Union, and the ultracentrifuge used in Europe.

BRAZIL

WORK ON ANGRA II TO RESUME AFTER FEBRUARY 1980

Rio de Janeiro JORNAL DO BRASIL in Portuguese 6 Dec 79 p 25

[Text] Brasilia--Work at the Angra II nuclear powerplant will only begin after February next year, it was decided yesterday at the meeting of the CSE--Superior Energy Council--an advisory agency of Minister of Mines and Energy Cesar Cals. Work has been halted until the foundation reinforcement plan has been completed.

At a CSE meeting, the presidents of FURNAS--Powerplants--Licinio Seabra, the CNEN (National Nuclear Energy Commission), Hervasio de Carvalho, and a representative of NUCLEN (NUCLEAR [Brazilian Nuclear Corporations] Engineering), the three parties involved in the problem, made an explanation to the other members of the council, showing the status of the project.

It was decided at that time that next February the three parties involved will present the foundation reinforcement plan so that the work can still be reinitiated during the first half of 1980. The decision to reinforce the foundations of the Angra II powerplant was made by the CNEN, the regulatory agency of the nuclear sector, which found dangers of land tremors in the area of such intensity that the foundations could not withstand them, as was called for in the original plan.

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CSO: 5100

BRAZIL

TRAINING OF NUCLEAR TECHNICIANS INADEQUATE, PHYSICIST CLAIMS

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 7 Dec 79 p 7

[Text] The method of training Brazilian technicians in Germany will not allow the assimilation of nuclear technology by Brazil, it was charged yesterday in Itaipava, state of Rio, by Professor Paula Leite of the Personnel Training and Improvement, an agency of the Ministry of Mines and Energy. He said that the country is paying 900,000 cruzeiros for the training of each of those technicians and will still not obtain nuclear technology at the end of that training. "Therefore," said Paula Leite, "it is difficult to speak of exporting technology because we do not even have it for ourselves."

As far as he is concerned, "The transfer of technology is only possible through the work of competent people. The technicians studying in Germany are still too young, too recently trained, therefore, without enough experience to learn the technology. Moreover, the selection of Brazilians for study in Germany is done by the Germans themselves, who exclude our best professionals."

The statements were made after the discussions of the First Seminar on Nuclear Guarantees held in Itaipava, where 30 technicians of the companies taking part in the nuclear program did not arrive at a conclusion on the first day of discussions on the Brazilian standards to be adopted.

Acoustics and optics expert Lauro Xavier Nepomuceno declared: "No one knows what is being done on guarantees of quality because the CNEN (National Atomic Energy Commission) is only now beginning to train the technicians. Meanwhile, Brazilian standards are being made on the basis of translations of the standards of five countries in addition to those of the International Atomic Energy Agency."

Nepomuceno revealed that the standards for the Angra II powerplant, pursuant to the agreement with Germany, have not yet even been drafted. That fact was finally confirmed by NUCLEN [NUCLEBRAS Engineering] technician Ulrich Grandt. Moreover, the Angra II plan, for the nuclear as well as for the conventional phase of the powerplant, has not yet been completed.

More categorical in his criticism, Nepomuceno revealed that "the standards for the powerplants in the agreement will be imposed by NUCLEN." The German technicians themselves declare that "they are the result of their work performed a long time ago and, therefore, they are not going to reveal its procedures." Meanwhile, Brazilian technicians responsible for nuclear quality control and safety, do not know whether the CNEN has the power to refuse some standards imposed by the company.

Credibility

Against the position of some technicians on the creation of Brazilian standards, Paula Leite questioned the credibility of those standards. According to him "there should be no concern about creating Brazilian standards because it would in no way benefit our country." He also questioned the idea that the preparation of Brazilian standards could improve quality and whether anyone would believe in them.

According to CNEN engineer Waldyr Pollis, it would be extremely difficult and onerous for the agency to oversee all tests performed at Angra I. He said: "At any rate, the CNEN observes and witnesses only 30 percent of the tests which follow the standards of the NRC--Nuclear Regulatory Commission--, the American nuclear commission." On the other hand, Lauro Xavier Nepomuceno believes that despite many criticisms, and even if the powerplants are not built, the nuclear program will bring benefits to Brazil. According to him, the program will allow the development of other areas in technological terms, changing the industrial mentality. As far as he is concerned, "The nuclear powerplant would be a byproduct of the program in the example of the NASA space program."

As far as the powerplants are concerned, pressure tests have already been performed at Angra I, one of the most critical phases. The PWR [pressurized water reactors] work under a pressure of 160 atmospheres but the tests were performed at a pressure of 200 atmospheres and there was no leakage at the welds. In May the reactor core will be loaded with fuel, and it will take 5 months until full power is reached.

8908

CSO: 5100

BRAZIL

DISSENSION REPORTED AMONG NUCLEAR PROGRAM AGENCIES

Sao Paulo FOLHA DE SAO PAULO in Portuguese 5 Dec 79 p 6

[Text] The existence of important areas of dissension among the government agencies responsible for executing the Brazilian Nuclear Program (CNEN [National Nuclear Energy Commission], NUCLEBRAS [Brazilian Nuclear Corporations], NUCLEN [NUCLEBRAS Engineering] and FURNAS [Power-plants]), was revealed yesterday in Brasilia by nuclear physicist David Simon, former assistant to the president of FURNAS and the former superintendent of NUCLEN, when he testified before the Senate Investigating Committee [CPI], which is investigating the Brazilian-German nuclear agreement.

According to the physicist, the greatest hindrance to the good work of the nuclear agreement resides in the absence of harmony among the various organizations, which execute it in its industrial, international policy, financial and other aspects.

Pointing out the existence of "cordial enmity" among the executors of the nuclear program, he emphasized that in the visit made to Angra dos Reis, President Figueiredo inquired about coordination among the various agencies and was only given the evasive answer that everything was going well. In his opinion, they lost a good chance to speak clearly on the possibilities of a better understanding, he added.

National Security

David Simon stated the opinion that the signing of the nuclear accord was motivated by the Brazilian desire for international "status" and possibly for national security. "I have that impression," he said, "because Brazil is in a position to satisfy the demand for energy without the need to resort to nuclear sources."

In Favor of the Agreement

He emphasized that he is not against the agreement because he sees in it new and beneficial aspects for the country. Simon spoke of the need for a change in the rate of its implantation "because the Brazilian economic situation calls for it."

He also said that before choosing Germany, the Brazilian Government consulted with the United States and France, neither of which showed an interest in signing an agreement with Brazil. He added that the Brazilians wanted the ultracentrifuge method of uranium enrichment (used by Germany) but that Germany refused to provide that technology, arguing that there were insurmountable political obstacles, therefore, the country had to settle for the jet centrifuge method, which was available.

8908

CSO: 5100

BRAZIL

NUCLEBRAS SEEKING LAND FOR NUCLEAR PLANTS, LANDOWNERS REPORT

Rio de Janeiro O GLOBO in Portuguese 4 Dec 79 p 6

[Text] Campos (O GLOBO)--Landowners north of Sao Joao da Barra confirmed that NUCLEBRAS [Brazilian Nuclear Corporation] technicians put out feelers for the purchase of an area of three alqueires of land [an alqueire equals 242 or 484 ares] near the border with the state of Espirito Santo, probably for the installation of an atomic waste re-processing plant.

One of those landowners is attorney Nicassio Alvarengo, who said he was approached by the president of NUCLEMON [NUCLEBRAS Monazite and Associated Elements, Ltd.] Brigadier Faria Lima. NUCLEMON already has a plant for processing monazitic sand and other heavy minerals in Buena, district of Sao Joao da Barra.

The first report on the establishment of an atomic waste reprocessing plant in Sao Joao da Barra came from Deputy Jorge Roberto Silveira, Brazilian Democratic Movement (MDB), in the Legislative Assembly. Engineers at NUCLEMON headquarters refused to speak on the subject.

According to contacts made between NUCLEBRAS and the landowners of the extreme north of Sao Joao da Barra, the corporation wants to lease three alqueires of land near the Buena monazitic sand processing plant.

The concern of attorney and rancher Nicassio Alvarenga is that the value of his land will go down because of the probable installation of the NUCLEBRAS plant. "Speaking in plain Portuguese, they are going to choose me for dumping atomic wastes and that is worrying us," concluded Nicassio.

8908
CSO: 5100

BRAZIL

BRIEFS

URANIUM RESERVE FIGURES—According to estimates made by NUCLEBRAS [Brazilian Nuclear Corporations] technicians, Brazilian uranium reserves are four and one-half times larger than the entire accumulated national production of petroleum between 1941 and 1978 if the reserves existing in December 1978 are added up. The uranium reserves in the ground, without estimating the discovery and evaluation of new deposits made in 1979, amount to 193,800 tons. On that total, nearly 70 percent can be utilized, the equivalent of 1,310,000,000 tons of petroleum [Text] [Sao Paulo FOLHA DE SAO PAULO in Portuguese 4 Dec 79 p 79] 8908

CSO: 5100

CHILE

BRIEFS

LITHIUM RESERVES, EXPLOITATION--Cmdr Rolando Soto, director of nuclear material at the Chilean Atomic Energy Commission, reported here today that Chile has 30 percent, more than 1,500,000 tons, of the world lithium reserves, most of which are in the Atacama Desert 2,000 km north of Santiago. He also stated that the Chilean Government intends to exploit this mineral and is studying the possibility of constructing a processing plant which will cost approximately \$23 million and produce 5,500 tons of lithium carbonate per year. This product will be used as a nuclear energy source and for production of glass, ceramics, rubber, copper, brass and other products. [Paris AFP in Spanish 1738 GMT 20 Nov 79 PY]

CSO: 5100

URANIUM SALES DANGERS DISCUSSED

London WEST AFRICA in English 10 Dec 79 p 2268

[Text] WHAT HAS made the issue of uranium in Africa far more serious and calls for the attention of all African states as well as the international organisations which work for the non-proliferation of nuclear arms is the recent revelation that some uranium from one of the mines in Niger disappeared on route to its unknown destination. There were allegations that the uranium, carried in trucks to the Port of Cotonou, had been hijacked for Libya or Pakistan. The Niger Government's response was not exactly to deny the disappearance of the uranium but to emphasise that the government holds a 31 per cent share in its two mines and that it will dispose of the product as it wishes.

Moreover Niger, it continued, regards the uranium not as a strategic product but as a commercial export. Therefore, the implication is, anyone who wants some can buy. In fact, Niamey pointedly said that there was nothing to stop Pakistan or Libya approaching the government to negotiate.

A few days later the French Government conceded that it had been selling uranium to Pakistan. Pakistan has always denied that it is making the "bomb", but guards its nuclear activities with obsessive secrecy. Diplomats travelling near the installations have recently been attacked. The Pakistanis have also claimed that they have their own uranium.

Even this patchy story is sufficient to raise certain questions that are essential to African security, let alone its independence. Did France use uranium acquired from Niger? Even if it did not, it was using uranium acquired in Africa to sell to a third party whose motives are possibly dubious. What exactly does Niger mean when it claims, as it did, that all its sales are conducted under the specifications of Euratom and the International Atomic Energy Agency? What are the exact terms of agreements between France and its African uranium suppliers? How is it that France, which also has its own designs for an independent nuclear force, can retain a contractual grip over its sources in Africa with a view to maintaining a supply well into the future? Finally, what is done about security? Niger is not the only country with uranium in the continent and one must wonder what measures are taken to ensure that uranium is not just removed or stolen for the purposes of individuals or groups. The development of a crude but sufficiently effective bomb is not as difficult as some would imagine.

A nuclear axis between some states in Europe and South Africa is as good as proven. It is a matter that is indeed on Africa's doorstep. When security and the defence of the continent from outside intervention has become such a major topic of concern, then does it not behove governments in Africa to let it be known exactly how they intend to dispose of this potentially deadliest of all their assets?

INTER-AFRICAN AFFAIRS

BRIEFS

URANIUM MINING IN BAUCHI—It was announced in Lagos today that evidence of the existence of uranium has been observed in the Gombe area of Bauchi state. Addressing a news conference in the federal capital, the minister of mines and power, Alhaji Mohamed Ibrahim Hassan, said that the federal government has established the Nigerian Uranium Mining Company under the Nigerian Mining Corporation. He added that the government had also signed a partnership agreement with some foreign interests and that mining activities will soon move to Gombe town. Alhaji Mohamed enumerated other areas believed to be harboring uranium. These include Cross River, Lokoja, Benue and Sokoto. The minister further disclosed that the federal government had invested more than 2 million naira to develop the tin zinc lead project in (Riniwaye) in the Plateau state. [Text] [AB262235 Lagos Domestic Service in English 2100 GMT 26 Nov 79 AB]

CSO: 5100

KIRILLIN SPEAKS ON NUCLEAR POWER, ENVIRONMENTAL PROTECTION

LD232126 Moscow TASS in English 1731 GMT 23 Nov 79 LD

["Europe: Environmental Protection"--TASS headline]

[Text] Moscow, November 23, TASS--"Atomic stations [as received] represent no environmental hazard if they are correctly designed, built and used. This is the opinion of Soviet scientists", said Vladimir Kirillin, vice chairman of the USSR Council of Ministers, chairman of the State Committee for Science and Technology. He was speaking at a press conference here today.

"Our belief in the dependability of atomic power stations is based on observations over many years: Since the first power station was commissioned in Obninsk in 1954 and [as received] to this day we have not had a single radio activity excursion."

At present the Soviet Union has atomic power stations with a total capacity of ten million kilowatts. Next year this potential will be increased by four-five million, Kirillin said.

The problems of atomic power engineering were touched upon at the European Conference on Cooperation in Environmental Protection which was held at the initiative of Leonid Brezhnev. At this meeting, which was held in Geneva last week, Vladimir Kirillin was leading the Soviet delegation.

The Geneva conference, Kirillin said, outlined constructive avenues for international cooperation in preventing air pollution. On the order of the day are similar conference to be held to discuss the problems of protection of water courses, fauna and flora.

Among those present at the press conference was Yuriy Israel, chairman of the Soviet Committee for Hydro-Meteorology and Environmental Control. He stressed that in the Soviet Union environmental protection is a concern of the state. In recent years a number of governmental laws and resolutions were passed in order to keep clean the rivers Volga and Ural, the Azov, Caspian and Black seas. One more law, on prevention of air pollution, is now being drafted.

At the same time Yuriy Israel pointed out the environmental protection measures can be effective only in the conditions of international cooperation.

An important prerequisite for strengthening scientific ties, he said, is termination of the arms race, and strengthening of peace and security in Europe.

CSO: 5100

USSR

'PRAVDA' ON NUCLEAR REACTOR CONSTRUCTION PROBLEMS, DEVELOPMENT

LD201439 [Editorial Report LD] Moscow PRAVDA in Russian 17 November 1979 publishes on page 2 a 1,600-word Leningrad dispatch from PRAVDA correspondent V. Senin under the headline "'Atomash' on the Izhora." The article describes the work of the Izhorskiy Zavod production association in manufacturing "nuclear steam-generating installations for nuclear power stations, including reactors with a capacity of 1 million kilowatts." Senin outlines some of the technical difficulties in constructing high capacity nuclear reactors and notes current developments at the association.

CSO: 5100

AUSTRIA

BRIEFS

NECESSITY OF NUCLEAR POWER—On the whole, leading political representatives of the capitalist world share the view, as the French example shows, that nuclear energy must gradually assume a leading role. Forcing through this solution, is not a simple matter, however; it is precisely here that the oil monopolies are putting up a silent and bitter, behind-the-scenes resistance. The case of neighboring Austria is typical. At the end of 1978 a referendum held there halted the construction at Zwentendorf of Austria's only nuclear powerplant. At that time public opinion succumbed to the manipulation of the oil monopolies and of false "protectors of the environment." Reports in the Austrian press reveal that even citizens are now beginning to realize the necessity of building nuclear powerplants.

[Ladislav Alster] [Excerpt] [AU210959 Prague RUDE PRAVO in Czech
15 Nov 79 p 3 AU]

CSO: 5100

FEDERAL REPUBLIC OF GERMANY

IMPORT, EXPORT OF NUCLEAR FUEL FOR 1978

Duesseldorf ATOMWIRTSCHAFT-ATOMTECHNIK in German Nov 79 pp 532-533

[Text] The statistics compiled by the Federal Office for Trade and Industry for the minister of the interior on the importation and exportation of nuclear fuel and raw materials for 1978 indicate increases of 67.9 percent in imports and 96.3 percent in exports over the previous year. The figures for the preceding year used for this comparison* are given in parentheses in the following text in each case.

Imports

A total of 1,966,988 kg (1,173,247 kg) of nuclear fuels and raw materials were imported. That is in conformity with the above-mentioned increase. The key items that were imported, as far as amounts are concerned, were depleted uranium, natural uranium and slightly enriched uranium imported from the USSR is not of Soviet origin. The natural uranium is exported there from various countries to carry out the splitting work, and it comes back to the FRG in full volume. The enormous increase in the importation of depleted material is brought about by this process. Natural uranium, uranium in the 3 to 10 percent, 10 to 25 percent and 85 percent stages of enrichment, plutonium and thorium were imported increasingly. Uranium of the enrichment stages of up to 3 percent and from 25 to 85 percent did not achieve the figures of the preceding year.

The breakdown of the individual items gives the following picture: depleted uranium, 818,561 kg (332,859 kg) = +153.4 percent (that increase is primarily the result of the importation of 760,242 kg (316,862 kg) = +139.9 percent from the Soviet Union); natural uranium, 311,132 kg (56,227 kg) = +453.4 percent (here it should be noted that the importation in 1977 was especially low by comparison with the preceding years; uranium enriched up to 3 percent: 404,810 kg (464,561 kg) = -12.9 percent; 3 to 10 percent:

*Cf. ATOMWIRTSCHAFT-ATOMTECHNIK No. 23, p 532 (Nov 78).

426,836 kg (310,095 kg) = +37.6 percent; 10 to 25 percent: 34 kg (0); 25 to 85 percent: 101 kg (835 kg) = -87.9 percent; over 85 percent: 349 kg (497 kg) = -29.8 percent; plutonium, 3 kg (0); thorium: 5,074 kg (4,514 kg) = +11.8 percent; irradiated nuclear fuels and raw materials: only 18 kg (1,649 kg). The importation of the preceding year did not fall within the usual limits.

Exports

A total of 576,755 kg (293,749 kg) of nuclear fuels and raw materials was exported, and here the increase amounted to 96.3 percent. An increase can be observed in the items which were key items as far as amounts are concerned: depleted uranium, natural uranium and uranium enriched up to 10 percent.

Highly-enriched material (over 85 percent) was exported in rather large amounts again. Plutonium and thorium were only exported in small amounts.

In the case of irradiated material, the exportation of uranium enriched up to 3 percent was stagnant and from 3 to 10 percent it was back at the 1976 level; its behavior in the preceding year deviated sharply.

The breakdown of the individual items gives the following picture: depleted uranium, 51,844 kg (12,587 kg) = +309.8 percent; natural uranium, 111,942 kg (69,377 kg) = +61.4 percent; uranium enriched up to 3 percent, 185,363 kg (104,545 kg) = +77.5 percent; 3 to 10 percent, 162,646 kg (59,151 kg) = +175 percent; over 85 percent, 211 kg (148 kg) = +42.6 percent; plutonium, 13 kg (0) and thorium, 27 kg (219 kg) = -87.7 percent. Irradiated nuclear fuels and raw materials showed the following breakdown: uranium enriched up to 3 percent: 46,595 (47,697 kg) = -2.3 percent; from 3 to 10 percent, 17,846 kg (6 kg) and over 85 percent, 63 kg (6 kg).

Table 1. Importation of Nuclear Fuels and Raw Materials Into the FRG in 1978 (in kilograms)

(1)	Versandungsland (4)	(2) mit 11-22% angereicherter Uran							(10)		(3) Summe	
		(5) abger. Uran	(6) Natur-uran	(7) 3%	(8) 10%	(9) 25%	(10) 85%	(11) über 85%	Pu	Th		
(11)	Frankreich	41 815	511	5 375	320	-	17	73	3	4 854	...	...
(12)	Belgien/Luxemburg	-	2	-	1 257	-	1	-	-	-	...	...
(13)	Niederlande	1 510	-	-	3	-	-	-	-	33	...	...
(14)	Großbritannien	11 419	110 100	7 188	-	1	1	-	-	9	...	...
(15)	Italien	3 122	-	-	-	-	-	-	-	-	...	...
(16)	Schweden	2	18 287	8 347	3 324	-	-	-	-	-	...	...
(17)	Schweiz	288	-	-	612	-	-	-	-	-	...	...
(18)	UdSSR	780 342	-	294 321	162 983	-	-	-	-	-	...	...
(19)	USA	51	1	91 571	218 337	33	82	275	-	88	...	...
(20)	Kanada	-	188 231	-	-	-	-	-	-	-	...	...
(21)	sonst. Länder	127	-	-	-	-	-	1	-	2	...	...
	Summe	818 981	311 132	404 810	428 838	34	101	348	3	5 674	1 000 000	

Key to Table 1:

- | | |
|--------------------------------|------------------------|
| 1. Exporting country | 11. France |
| 2. Uranium enriched with U-235 | 12. Belgium/Luxembourg |
| 3. Sum | 13. Netherlands |
| 4. Depleted uranium | 14. Great Britain |
| 5. Natural uranium | 15. Italy |
| 6. Up to 3 percent | 16. Sweden |
| 7. From 3 to 10 percent | 17. Switzerland |
| 8. From 10 to 25 percent | 18. USSR |
| 9. From 25 to 85 percent | 19. United States |
| 10. Over 85 percent | 20. Canada |
| | 21. Other countries |

Table 2. Exportation of Nonirradiated Nuclear Fuels and Raw Materials From the FRG in 1978 (in kilograms)

(1)	Verbraucherland	(5) (2) mit U-235 angereichertes Uran						(10)		(3) Summe	
		(4) abger. Uran	(5) Natur-uran	(6) bis 3%	(7) 3 bis 10%	(8) 10 bis 25%	(9) 25 bis 85%	85%	Pu	Th	
(11)	Frankreich	40 633	19 685	9 589	10 629	-	-	191	-	2	...
(12)	Belgien/Luxemburg	132	194	4	10 072	-	2	1	8	-	...
(13)	Niederlande	13	1	-	15 149	-	-	17	-	-	...
(14)	Italien	809	2 813	18 107	9 222	-	-	-	-	-	...
(15)	Großbritannien	4 994	2	-	-	-	-	-	8	-	...
(16)	Dänemark	-	-	-	-	-	-	18	-	-	...
(17)	Schweden	2	-	28 128	47 878	-	-	11	-	-	...
(18)	Schweiz	163	-	38 380	88 698	-	-	-	-	-	...
(19)	Österreich	108	-	91 452	-	-	-	-	-	-	...
(20)	Jugoslawien	32	-	-	-	-	-	-	-	2	...
(21)	Türkei	157	-	-	-	-	-	-	-	-	...
(22)	UdSSR	888	-	-	-	-	-	-	-	-	...
(23)	Tschechoslowakei	252	-	-	-	-	-	-	-	1	...
(24)	Ungarn	118	-	-	-	-	-	-	-	-	...
(25)	Rumänien	24	-	-	-	-	-	-	-	9	...
(26)	Tunesien	100	-	-	-	-	-	-	-	-	...
(27)	Südafrika	288	-	-	-	-	-	-	-	1	...
(28)	USA	18	-	2 882	-	-	-	14	-	-	...
(29)	Kanada	-	-	-	-	-	-	80	-	-	...
(30)	Brasilien	183	-	11	-	-	-	-	-	-	...
(31)	Argentinien	2	88 281	-	-	-	-	-	-	-	...
(32)	Iran	73	28	-	-	-	-	-	-	4	...
(33)	Pakistan	29	-	-	-	-	-	-	-	-	...
(34)	Südkorea	2 672	800	-	-	-	-	-	-	-	...
(35)	Japan	200	-	-	-	-	-	-	-	-	...
(36)	sonst. Länder	218	-	-	-	-	-	-	-	8	...
Summe		51 844	111 942	188 983	182 848	-	2	211	13	27	912 348

(Key on following page)

Key to Table 2:

- | | |
|--------------------------------|---------------------|
| 1. Importing country | 19. Austria |
| 2. Uranium enriched with U-235 | 20. Yugoslavia |
| 3. Sum | 21. Turkey |
| 4. Depleted uranium | 22. USSR |
| 5. Natural uranium | 23. Czechoslovakia |
| 6. Up to 3 percent | 24. Hungary |
| 7. From 3 to 10 percent | 25. Romania |
| 8. From 10 to 25 percent | 26. Tunisia |
| 9. From 25 to 85 percent | 27. South Africa |
| 10. Over 85 percent | 28. United States |
| 11. France | 29. Canada |
| 12. Belgium/Luxembourg | 30. Brazil |
| 13. The Netherlands | 31. Argentina |
| 14. Italy | 32. Iran |
| 15. Great Britain | 33. Pakistan |
| 16. Denmark | 34. South Korea |
| 17. Sweden | 35. Japan |
| 18. Switzerland | 36. Other countries |

Table 3. Exportation of Irradiated Nuclear Fuels and Raw Materials From the FRG in 1978 (in kilograms)

(1)	Verbraucherland	(2) mit U-235 angereichert, Uran				(3) Summe	
		(4) bis 3%	(5) 3 bis 10%	(6) über 10%	(7) sonst		
(8)	Frankreich	48 583	17 832	-	-	...	
(9)	Niederlande	-	15	-	2	...	
(10)	Schweden	2	-	-	-	...	
(11)	USA	-	-	83	-	...	
	Summe	48 585	17 847	83	2	94 507	

Key:

- | | |
|--------------------------------|--------------------|
| 1. Importing Country | 6. Over 85 percent |
| 2. Uranium enriched with U-235 | 7. Other |
| 3. Sum | 8. France |
| 4. Up to 3 percent | 9. The Netherlands |
| 5. From 3 to 10 percent | 10. Sweden |
| | 11. United States |

Table 4. Development of the FRG's Importation and Exportation of Irradiated and Nonirradiated Nuclear Fuels and Raw Materials From 1974 to 1978

Year	Imports (kilograms)	Exports (kilograms)
1974	463,268	225,421
1975	1,053,601	179,859
1976	910,955	242,067
1977	1,171,247	293,749
1978	1,966,918	576,755

9258
CSO: 5100

SECOND CHAMBER DEBATES NUCLEAR WASTE DISPOSAL

Rotterdam NRC HANDELSBLAD in Dutch 28 Nov 79 pp 1, 17

[Text] The Hague, 28 November—The majority in the Second Chamber feel that they are left no choice now that the government has asked for approval of a law permitting the return of radioactive waste to the Netherlands. Involved is nuclear waste from the reactors at Dodewaard and Borsele that remains after treatment in France and England. At the beginning of June the Chamber accepted a motion by Mrs Lambers-Hacquebard (D'66) [Democrats'66] in which approval was postponed until after the social debate on nuclear energy.

The government, however, requests the ratification at this time because the contracts for treatment of radiated fissile rods from Borsele and Dodewaard with the French company Cogema and the British Nuclear Fuels Ltd. (BNFL) are to take effect on 1 January. In both contracts the Dutch government agrees not to take actions preventing the return of the radioactive waste to our country.

The used fissile elements from Borsele and Dodewaard will, according to the agreements, be stored for a year (to cool down) at the factories in the French Cap la Hague and the British Windscale, after which they will be prepared for reuse by power plants.

The French and British governments will approve the contracts provided Cogema and BNFL, who cooperate in the United Reprocessors community of interests, are allowed to return the remaining waste to the country of origin after reprocessing. They want to avoid an accumulation of waste at the reprocessing factories.

The Dutch government finds that approval to take back nuclear waste must be given, because so far no alternative to reprocessing exists.

In case the contracts are not approved the Dutch power plants are stuck with above-ground storage of unprocessed fuel elements. And since the

Dutch government feels that both Dutch atomic reactors should remain in operation, they see no other alternative than to approve the reprocessing contracts so that removal of the fuel rods is made possible.

A long-term above-ground storage of the used fissile elements would prejudice the results of the social debate on nuclear energy according to the government. The government stresses the fact that keeping Borsele and Dodewaard in operation should be seen as separate from an eventual definite decision about the use of nuclear energy.

The government however does point out what the effect would be on the employment situation in case of an immediate shut-down of the two nuclear plants.

According to Ministers Van Aardenne (Economic Affairs), Ginjaar (Public Health and Conservation) and Van der Klaauw (Foreign Affairs), it is practically impossible to postpone the reprocessing contracts. They point out that the French and British factories already have an undercapacity expected to last for some time. If the agreements are not ratified now, signing new contracts will be virtually impossible for a long time, according to the statesmen. They say that not ratifying will result in the eventual shut-down of the plants in Borsele and Dodewaard.

The bill will probably be discussed tomorrow by the Chamber Committee on Nuclear Energy.

PvdA [Labor Party] member Zijlstra says he regrets that "we are forced from one decision into another" and that the government has created an irreversible situation. "The consequences of saying no are becoming very severe." Zijlstra also wants the Chamber to examine all passages of the embattled but largely secret contract with the French Cogema factory.

Mrs Lambers (D'66) hopes that the Second Chamber will insist on postponing definite ratification of the reprocessing agreements until after the social energy debate and until a permanent storage space has been found for the nuclear waste, for example in salt domes.

The actual return of the nuclear waste to the Netherlands is not to be expected until the 1990's, according to the government.

9314

CSO: 5100

SWEDEN

BRIEFS

NUCLEAR REFERENDUM ON 23 MARCH 1980--The referendum on nuclear power will take place 23 March 1980. The date was decided Wednesday by the five party leaders. Immigrants entitled to vote in the council elections in September will also be allowed to participate in the nuclear referendum. This was opposed by Costa Bohman. But much remains to be resolved. The parties should decide by the first week in December how the questions are to be phrased and the Riksdag resolution on the referendum should be adopted in mid-January. [Excerpt] [LD211143 Stockholm SVENSKA DAGBLADET in Swedish 15 Nov 79 p 1 LD]

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TURKEY

BENEFITS OF NATURAL URANIUM REACTORS POINTED OUT

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[Article by Dr Ahmet R. Bayulken, Istanbul Technical University, Nuclear Energy Institute: "Can National Contribution Be Made to Nuclear Energy?"]

[Text] The foremost problem of many countries in the world today, especially Turkey and similar developing nations, is the consumption of energy, which is needed in their push for industrialization.

All industrial establishments, from a small, two-person workshop to the giant production units employing thousands of people, have three basic needs for turning raw materials such as coal, mineral ores and chemical substances into finished or semi-finished materials to meet the market demand: Various machines and equipment, fully knowledgeable personnel and abundant energy to make the system work.

What Will It Be?

Until a half-century ago, all equipment and machinery in almost every field operated with the help of hydraulic engines or steam engines which used steam energy to drive a motor. It is now an unavoidable fact that electric energy prevails everywhere, for such reasons as high yield and ease of use.

The important thing is not how this type of energy can be obtained. Much has been written on this subject, and scientists have reviewed virtually every alternative in the subject, trying to find the best solution.

Purchasing electric energy from foreign countries is no solution in order to close the energy gap, because it increases external dependence. Seeking remedies whereby energy may be produced within the country, using local resources, and turning in this direction is the wisest choice of solution. If action is taken based on this policy, it is easily seen that the important tasks in producing electric energy economically within the country's borders fall upon nuclear stations as well as lignite-burning thermal stations and hydraulic stations. The fact that 500-plus atomic reactors are in operation or under construction in more than 30 countries today is excellent proof of this.

Time Lost

This is not a solution to be feared. If qualified people are employed in construction and operation, the necessary quality may be ensured and no operational errors will be made. This is why the debate on whether or not nuclear technology should be introduced into Turkey should come to an end and all of our brain power should be directed toward research into which type of nuclear reactor is best for the nation.

To say that a country has been newly introduced to nuclear technology actually means that it is quite behind. Certain countries were able to see 20 years ago the position that nuclear energy would hold today and, by using all their technological resources, have become the influential states in this regard. Turkey is not now influential in this field. But attention should at least be drawn to the fact that the nuclear technology that will be accepted will be of use to the nation, not just from the standpoint of producing electricity alone, but from other aspects as well. Another fact which must be borne in mind in this context as well is that Turkey is trying to keep the contribution it can make to this brand new technology at the highest level possible.

What Kind of Fuel?

First of all, whatever type it may be, Turkey is obliged, under the country's present technological circumstances, to buy the entire first reactor abroad. The important thing is that good advantage may be taken of the situation after it goes into operation.

A specific amount of fuel is needed each year in order that a reactor which is built may operate. If the type agreed upon is the American type reactor which uses "enriched" uranium 235, it would use 30 kilograms of 3 percent enriched uranium per megawatt of power produced per year, and this is the equivalent of a total of 160 kilograms of natural uranium. A Canadian type reactor, which uses "natural uranium" as fuel, consumes 100 kilograms of natural uranium per megawatt of energy per year.

The matter does not end, however, with annual uranium consumption alone. Since facilities which enrich uranium in the isotope 235 require very high investment and energy consumption, it is not possible to build them in Turkey. In that case, even if it were desired to build a fuel-agent plant in the country, it would always be externally dependent for the supply of enriched uranium. The number of countries having enrichment plants has increased somewhat. Some nations can provide enrichment in exchange for another nation's uranium. This has reduced their dependence to an extent. But they face the unhappy possibility that the selling nation may suddenly say, "No," or may seize the uranium sent for enrichment. One way out of this dependence is to seek ways to buy shares in the enrichment plants being built in Europe.

If a type of reactor using natural uranium as fuel were chosen, in addition to the possibility of consuming less uranium, Turkey would be able to exploit its uranium resources and would also have the opportunity to build fuel-agent conversion plants in Turkey. Freeing the fuel cycle from external dependence would be a most important step toward energy independence.

Plutonium, But...

Another very important matter requiring careful study is the connection with plutonium production.

As known, it is uranium 235 which is fissionable in a reactor, releasing energy. One of the resulting neutrons is captured by uranium 238, which is nonfissionable and has a very weak energy-producing capacity, producing plutonium 239, a very important fissionable material. Although fission of part of the resulting plutonium takes place as it is formed, a very large portion of it remains. Then this plutonium, after being cleansed of other fuel remnants, can either be used as fuel in the same type thermal reactors or can be saved for use in fast breeder reactors, which produce more fuel than they consume. Clearly, it is best from the standpoint of national energy independence to turn toward natural uranium reactors and fast breeder reactors, which operate on the uranium 238 - plutonium 239 cycle, instead of reactors dependent on uranium 235, which, like oil, will soon become less available and an element of pressure.

Moreover, while enriched uranium reactors are able to produce 25 kilograms of plutonium per terawatt hour (109 kwh [sic]) of energy produced, natural uranium reactors are able to produce 50-51 kilograms of plutonium.

The only problem with natural uranium reactors is the moderator element used in these reactors. The gas-cooled and graphite-moderated natural uranium reactors used in France and Britain for a while have been abandoned, and the Canadian type, heavy water-moderated reactors have replaced them in many countries. Nations like Argentina, India, Pakistan and Korea have based their nuclear strategies on this type, because the production of the heavy water used here as a moderator is not as big a problem as the production of enriched uranium. It is possible to build plants to produce this substance in conjunction with nitrogen fertilizer or sulfuric acid plants.

It is seen that reactors using "natural uranium" have important advantages such as giving rise to a series of investments opening up new areas of employment within the country and enabling the safe use of national uranium deposits. In this situation, then, what should Turkey do?

If a developing nation enters the nuclear age with an enriched uranium reactor, it needs the advantage of building its later reactors of the natural uranium type. India may be given as the best example of this.

The first reactor built in this country was the 400 megawatt, boiling-water, American type enriched uranium reactor, which was built near Bombay and began operation in 1969. All six of the reactors (2 - 202 megawatt, 2 - 220 megawatt and 2 - 20 megawatt) subsequently built and scheduled for building are heavy water natural uranium reactors. The national contribution to the building of these reactors, the first of which were built by Canada, rose steadily and quickly, reaching 100 percent in the latest units. This is a fact which must be taken into account.

It is wrong, in implementing such a strategy, to consider a loss the enriched uranium reactors which were first built. The reason is that the unused, light enriched uranium found in the fuels extracted from these reactors can be mixed, after purification of fission residues, with natural uranium, without the need for reenrichment, and used with very high yields in natural uranium reactors.

It has become rather difficult, however, to build this type of reactor, because Canada, the principal builder of this type, has avoided entering contracts with developing nations, since discovering that the plutonium produced in the reactors was being used by certain countries for building atomic bombs.

In this case, Turkey has two choices in its quest to contribute to the nuclear age: After the Akkuyu power station, which will operate with enriched uranium, it can turn to the natural uranium type, establishing close cooperation for this purpose with countries now thoroughly versed in the technology, such as Pakistan or India, or it can guarantee the fuels for its enriched uranium reactors. However, it must not be forgotten that, under certain circumstances, foreign nations may place an embargo on goods which have already been paid for and not send them.

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